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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,658	12/13/2005	Alan Robert Chapman	M8540/303808	2272
John S Pratt Kilpatrick Stockton Suite 2800 1100 Peachtree Street Atlanta, GA 30309-4530				
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MOHADDES, LADAN				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/560,658

Applicant(s)

CHAPMAN ET AL.

Examiner

LADAN MOHADDES

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☒ Claim(s) 1 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/88)
- Paper No(s)/Mail Date 12/14/2006; 09/25/2006
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

1. Claim 1 is objected to because of the following informalities: the inclusion of "separator" in parenthesis following "a flow field plate" is inappropriate since claims should not include parenthesis unless referring to a reference numeral in the drawings. Further, the claim as written makes it unclear to the examiner whether the flow field plate being claimed must be a separator plate or could be a separator plate. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. The terms "substantially" and "strongly" in claims 10 and 11 are relative terms which render the claims indefinite. The term "substantially" and "strongly" are not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

For the purpose of compact prosecution the examiner assumes channels have constant length in claim 10 and variable length in claim 11, respectively.

4. Claims 12 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 16, it is unclear how the permeable wall can also be impermeable. For the purpose of examination, claim 16 will be interpreted as being drawn to a permeable wall with flow resistance channel being impermeable.

Regarding claim 12, it is unclear what the applicant means by indicating that the lands are not aligned with the symmetry of the arrangement of the lands. For the purpose of examination, claim 12 will be interpreted as lands being non-circular.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3, 8-11, 16 and 19 are rejected under 35 U.S.C. 102(a) as being anticipated by Turpin (GB2387476).

Regarding claims 1 and 17, Turpin discloses a flow field plate for a fuel cell or electrolyser (Abstract), comprising branched primary gas delivery/removal channels (Fig. 2, **4**, **5**, **7** and **8**) feeding narrower secondary gas diffusion channels (Fig. 2, **10**) defined by an array of lands (Fig. 2, **9**) forming a network of interconnected gas diffusion channels there between.

Regarding claims 2 and 3, Turpin discloses a tiled array of flow field segments which are arranged in parallel (Fig. 1).

Regarding claims 8 and 9, Turpin discloses that branched gas delivery and removal channels which are interlocked (Fig 2., angled channels) and a permeable wall separating same (page 6 In 26-28) in which the permeable wall is concertinaed, having wall segments extending along each fold of the wall, and end wall segments at each turn of the wall (Fig. 1).

Regarding claim 10, Turpin discloses that the diffusion channels between lands have constant width (Fig. 2, **10**)

Regarding claim 11, Turpin discloses that a pattern of channels with different width can be applied (page 10, In 17-20).

Regarding claim 16, Turpin discloses that the flow field comprises a impermeable wall (page 8, In 23) which separates regions of the flow field and functions as a choke to resist gas flow through the wall (page 10, In 20-22).

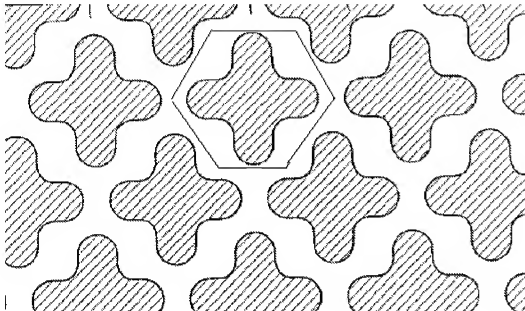
Regarding claim 19, Turpin discloses a fuel cell comprising the claimed flow field plates (page 4, In 11 and page 8, In 12-19).

Regarding claim 20, Turpin does not disclose that the power deliverable by each flow field plate is in excess of 750 mW.cm^{-2} calculated on the working surface of the flow field. As taught by *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977): "Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable". Turpin discloses a flow field plate which is materially and structurally identical to that of instant application and therefore one would expect that power deliverable of the flow field plate will inherently be similar at the same current densities and voltage.

7. Claims 1, 7 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Wilkinson et al. (US Publication 2001/0041281, hereafter referred to as Wilkinson, already of record).

Regarding claim 1, Wilkinson discloses a flow field plate for a fuel cell (Fig. 1, 1 and 9-10), comprising branched fluid delivery and removal channels (Figs. 2) defined by an array of lands (Fig. 2a-e, 26) forming a network of interconnected fluid diffusion channels there between (Fig. 2a-e, 24 and 25) to deliver fluid to diffusion layers (paragraph [0028]).

Regarding claim 7, Wilkinson discloses flow field plate, which branched primary fluid delivery/removal channels comprise a hexagonal network of channels (Fig 2c, the lines inside the channel are added by the examiner for the purpose of the demonstration of hexagonal network).



Regarding claim 18, Wilkinson discloses that the lands of flow field plate are provided in the gas delivery/removal channels to support diffusion layers from deflecting into the channels (paragraph [0029]).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turpin (GB2387476) in view of McElroy et al. (US Patent 6,251,534, hereafter referred to as McElroy) or Ernst et al. (US Patent 5,945,232 hereafter referred to as Ernst).

Regarding claims 4-6, Turpin does not expressly disclose that the flow field segments are arranged in series, or as a parallel assembly of series connected flow field segments or as a series assembly of parallel connected flow field segments. However, series or parallel arrangement of flow fields and their connection is well practiced in the art. In the same field of endeavor, McElroy teaches flow field plates that can be arranged so that the flow of gas through fuel stacks is in parallel in some conditions and in series under other conditions (col 6, ln 51-58 and Figs, 3, 4, 6) for the

benefit of optimum flow based on the fuel cell's power output (col 3, ln 19-33). Ernst teaches a flow plate comprising a plurality of fluid flow sub-plates (segments) (Fig. 5 and 6), which are connected in series or parallel or a combination thereof, to provide a higher output voltage (col 3, ln 40-58).

Therefore, it would have been obvious for the person of the ordinary skill in the art at the time the invention was made to arrange the flow fields segments in either of the configurations of series and parallel connect in series or parallel for optimum flow field and better fuel cell performance.

12. Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turpin (GB2387476) as applied to claims 1-3, 8-11, 16 and 19-20 above and further in view of Abdou et al. (WO 02/069426, hereafter referred to as Abdou, already of record)

Regarding claims 12-15, Abdou discloses diamond (Fig. 1B) and hexagonal (Fig. 1A) lands which are aligned on a hexagonal array (Fig. 1A).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LADAN MOHADDES whose telephone number is (571)270-7742. The examiner can normally be reached on Monday to Thursday from 8:30 AM to 6:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LADAN MOHADDES/
Examiner, Art Unit 1795

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795